AMENDMENTS TO THE SPECIFICATION

Please replace the third full paragraph on Page 3, with the following amended paragraph:

The present invention also includes a composite of activated carbon and a magnetic material. The composite preferably further includes a photocatalyst . The activated carbon is preferably powdered activated carbon, and the magnetic material is preferably either magnetite, maghemite, hematite or goethite.

Please replace the first paragraph on Page 6, with the following amended paragraph:

In accordance with the present invention, activated carbon/iron composites are prepared by dispersing iron salts in deionized water already containing a slurry of powdered activated carbon. When followed by NaOH addition, chemical precipitation occurs implanting the iron on to and in the pores of the activated carbon. Preferably, a combination of salts are used to prepare the composite in accordance with the invention. However, it will be understood that the use of one iron salt is within the scope of the invention. The iron salts are preferably a combination of $FeCl_3$ (ferric chloride) and $FeSO_4$ (ferric sulfate) because they are inexpensive, and can be added in various ratios (i.e., about 1:99 to ~~about99:1~~about 99:1) to achieve the desired magnetic species (e.g., magnetite (Fe_3O_4), maghemite (γ-Fe_2O_3), hematite (α-Fe_2O_3), and goethite (α-FeO(OH))). (Unless otherwise noted, all ratios expressed herein are weight ratios.) Other iron salts and magnetic species suitable for use in the present invention will be apparent to one skilled

in the art. Preferably, the weight ratio of chloride salt to sulfate salt is greater than about 1:1, most preferably about a 2:1 ratio of $FeCl_3$ to $FeSO_4$. In some situations, however, a ratio of chloride salt to sulfate salt of greater than about 3:1 may be desired, as would be appreciated by one of ordinary skill in the art, such as when one desires to increase the chloride loading on the carbon surface since chloride is known to chemically bond mercury.

Please replace the paragraph bridging Pages 6 and 7, with the following amended paragraph:

To achieve a desired activated carbon/iron composite ratio in accordance with the invention, activated carbon may be added by adjusting its weight in order to obtain activated carbon/iron oxide weight ratios of preferably less than about 5:1, more preferably less than about 4:1, even more preferably less than about 3:1, and most preferably an activated carbon/iron oxide weight ratio of about 1:1. For example, a composite in accordance with the present invention may be suitably prepared by the addition in solution of $FeCl_3$, $FeSO_4$ and activated carbon. The carbon and iron solution may then be mechanically mixed, and then NaOH added dropwise to increase pH to a level whereby the iron oxides ~~precipitated~~precipitate. The material may then be dried. It will be recognized that heating at high temperatures (i.e., greater than about 150°C) in inert environments or reducing environments can enhance magnetite formation. It is within the scope of this invention to realize that iron in its variety of forms and chemical formulas could also be added to the carbon via chelation or vapor phase adsorption.

Please replace the first full paragraph on Page 7, with the following amended paragraph:

Titania and other photocatalysts (e.g., ZnO, SnO_2) are well known for creating hydroxyl radicals ~~(OH)~~(OH·) when irradiated with UV light. These OH radicals are strong oxidizing species that can oxidize organic and inorganic compounds. Although this is well known, there is no evidence currently available that describes the benefits of adding titania to a magnetic carbon composite. The titania (available as titania precursors (e.g., titania ~~iso prop oxide~~isopropoxide) or nano-sized titania (e.g., P-25 by Degussa)) or other photocatalyst may be added to the magnetic carbon composite in accordance with the present invention via boil deposition, hydrolysis, mechanofusion, or sol gel methods. For example, during the boil deposition procedure, the activated carbon may be mixed with the titania while the water is driven off through evaporation. To achieve a 1% titania weight loading (based upon the total weight of the titania and activated carbon), for example, about 100 mg of activated carbon may be mixed with about 1% by weight titania. Preferably, the titania loading is less than about 10% by weight, more preferably less than about 7% by weight, and most preferably less than about 5% by weight, based upon the total weight of the titania and MPAC, to avoid blocking adsorption sites.